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NOV 17 1947

Electrical World *News Issue*

NOVEMBER 15, 1947

W. M. Scott, Jr, left, President, I-T-E Circuit Breaker Co, and B. W. Kerr, President, Railway & Industrial Engineering Co, Whose Firms Have Amalgamated under I-T-E Ownership

A McGRAW-HILL PUBLICATION

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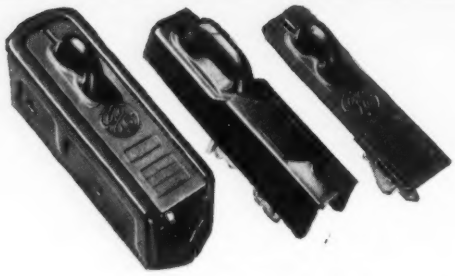
PRIMARY FUSE CUTOUTS

for all service requirements

INDICATING—DROP-OUT—RECLOSING



Interchangeable doors make these enclosed cutouts the most versatile in their field. *Three interchangeable doors*—indicating and drop-out, two-element reclosing, and disconnect—available for each current rating; *fit both the 5-kv and the 7.5-kv housings*. Just five major stock parts, for both 50- and 100-ampere ratings, fill all your requirements. Bulletin GEA-3448-B tells the complete story.

NON-INDICATING

These cutouts, lowest in price of all wet-process porcelain-enclosed cutouts, enable appreciable savings where indication is not necessary.

With exceptionally liberal design of contact areas and interlocking barriers, these cutouts are tops in the non-indicating field.

More than a million and a half in service have proved their high mechanical and electrical strength, and overall durability. Bulletin GEA-2390-C gives complete information.

General Electric also has a complete line of oil fuse cutouts, secondary cutouts and fuses, and universal conventional and Hi-surge fuse links. ***Apparatus Department, General Electric Company, Schenectady 5, N. Y.***

Compare each with its field for reliability, performance and flexibility of application!

OPEN-TYPE, DROP-OUT

This is the first "bird-proof" cutout in the open-type drop-out field. The mounting support is cemented into the one-piece solid insulator in the *opposite side* from all live parts—minimizing possibility of bird or animal blowing a fuse by touching a live part and the mounting at the same time. Note the closely coupled fuseholder which can be removed or replaced easily with standard switch stick.

FLIP-OPEN

A low-cost cutout for primary fusing of rural lines where possible short-circuit current is limited. Like the open-type drop-out cutout the Flip-open cutout is virtually "bird-proof." Double-wedge silver-plated contacts grip the fuse link cable. Helical-wound springs retard vibration stresses on fuse link. Like all G-E cutouts, the mounting support is cemented into the porcelain insulator for exceptional strength and durability. Bulletin GEA-4224-A gives details.

GENERAL ELECTRIC

Vol. 128, No. 20

NEWS
ELECTRICAL WORLD

ELECTRICAL INDUSTRY'S WEEKLY NEWS REPORT

The Electrical Week

The water shortage, which has been troubling some power systems more than any other factor, eased considerably in three areas recently, but worsened or continued troublesome in three others. While one area removed load restrictions, another brought in a Navy vessel for help. In Chicago, 8,500 people swarmed over the Lighting Exposition, and heard speakers push the Planned Lighting Program hard. In Washington, a civilian committee took some of the water out of the power equipment program advanced by 16 Marshall Plan nations. Back in Chicago, the AIEE heard the 500-kv transmission experiments at Brilliant, Ohio, hailed as the opening of a new era. And in Philadelphia, the I-T-E Circuit Breaker Co took over the Railway and Industrial Engineering Co in the most important shift among electrical manufacturers in some time.

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Immediate repeal of federal excise taxes on electric energy, light bulbs and other commodities was demanded last week by AFL Vice-President Matthew Woll. Woll is a member of a special tax study group reporting to the House Ways and Means Committee. The rest of the group urged elimination of "inequities in particular excises," but failed to specify the inequities.

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Shades of war-time component shortages. One large Southeastern company which has six steam turbines on order is not particularly worried that the machinery will be delivered behind schedule. Its concern is over such items as piping, construction steel, valves, etc. It brings back the days when there was absolutely no trouble in getting a battleship fast, but worth your life to try to get anything that went into a battleship.

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Aluminum industry people are trying to convince the armed forces that they should stockpile aluminum ingots rather than bauxite. Result would be to keep aluminum production at high level, with the stockpile being supplied whenever ordinary demands fell off. The aluminum people maintain a discreet silence when questioned as to how the increased power demand would be met.

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Shunt capacitors are going into utility systems in large blocks. One Pennsylvania utility will install 51 banks of 900-kvar switched capacitors. This installation, the country's largest, results from an extensive calculating board study. Switching will be sequential on voltage variation. Another is installing 17 switched banks of 540 kvar. They will be standardized to permit moving around the system with a minimum of difficulty.

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Interior Department power people are watching the St. Lawrence seaway and power project closely. They are thinking of control over marketing the energy its hydro plant would produce. This idea is based on Section 5 of the 1944 Flood Control Act, which lets Interior sell Army-generated power. But Interior's thinking conflicts with the ancient understanding that the New York State Power Authority would take over both the plant and its energy, once it is built.

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"Successful" is the final verdict on the Alabama Power Co-U.S. Bureau of Mines experiment on underground coal gasification. The Bureau has closed the file with a report that "all primary and secondary objectives were achieved."

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Zooming demand for natural gas is threatening a distinct change in that fuel's competitive position, particularly as a boiler fuel for electric power generation. President J. B. Thomas, Texas Electric Service Co, told newsmen on the recent EEI tour that "we are prepared to convert some of our plants to solid fuels when our gas contracts expire." He added that new steam plants in the gas areas are being designed to burn solid fuels also, if necessary. Texas has considerable deposits of lignite and sub-bituminous coals.

Fuel not Capacity Worries Utility Management in 3 Areas

Lack of Rain Affects Hydro Plants in Maine, Canada, and Missouri—Ontario Hydro Orders Limited Brownout—Navy Sends Ship to Portland—New York Power Restrictions Lifted

By Kenneth K. Kost

NEW YORK—Not capacity but fuel worried utility management this week. The fuel was water and only nature could furnish it. Nature did in New York, the Pacific Northwest, and the Southeast. But in northern New England, neighboring Canada, and Missouri, utilities still sought to overcome the effects of the present water shortage.

Everywhere that hydro power is tight, neighboring utilities also are affected. Either they are called upon to send more power than they can spare to shortage areas or else they themselves need the hydro power that can't be generated. And as usual at this time of the year, customer demand is rising week by week.

In New York, improved water conditions in the Adirondacks and other sections supplying hydro power to the Niagara Hudson System made it possible for the Buffalo Niagara Electric Corp and other system companies to remove their restrictions on industrial consumers.

Northwest Situation Improves

In the Pacific Northwest, the power situation was improving rapidly, though utilities did start the month with a terrific scare. The Spokane River is now flowing nearly twice as fast as at this time last year. Conditions on the Columbia are satisfactory. President Paul B. McKee, Pacific Power & Light Co, reported to stockholders that water conditions were so favorable that there has been little need to burn much high-cost oil.

Last month, Grand Coulee put its seventh 108,000-kw generator on the line (see centerspread). This gave the western division of the Pacific Northwest Power Pool a capacity of 2,853,000 kw. On October 31, the pool members got a scare when the new unit developed bearing trouble and a 58,000-kw unit at Booneville was shut down when lead wires burned out. This gave the western half of the pool only 129,000 kw of reserve capacity. Engineers figured that an extremely dark day would drive demand up enough to take 100,000 kw of this. But the units were put back into operation before any serious difficulty arose.

South, in Los Angeles, the power situation improved when a contract was signed for 1,200,000 bbl of fuel oil at $1.85 per bbl, plus a 13-cent delivery charge.

In the Southeast, only Virginia and Florida (the latter a thermal-power state) are in a tight spot. Reservoirs in Georgia, Alabama, and Tennessee are in fairly good shape. Extremely heavy rains have about filled the power reservoirs in the Carolinas. Heavy rains in the Southeast generally come during the first three months of the year. In the fall, power systems usually start to draw down water in the reservoirs so as to empty them by the end of December to catch all possible runoff. This year, they are using all the steam capacity available and conserving water, a practice started with foresight last summer.

In Maine's Aroostook County, where last week severe power restrictions were imposed, conditions were expected to improve with the arrival, November 11, of a Navy destroyer escort, the *U.S.S. Maloy*, at Portland. The *U.S.S. Foss* is at the Boston Navy Yard, ready to proceed to Maine if needed.

The *Maloy* was rushed from Boston when Maine's Gov. Hildreth appealed to President Truman for aid. Joining in the plea were Maine's Congressional delegation, the Public Utilities Commission, and power company representatives.

The *Maloy* has two turbo-generators with a combined rating of 3,600 kw. These deliver 2,700-v, 60-cycle, 3-phase energy for propulsion. At Portland, the energy will be fed into the Central Maine Power Co system, which will wheel it to the Maine Public Service Co over Bangor Hydro-Electric Co lines.

Conditions in Aroostook County were serious. Street lighting had been eliminated, industries were operating only between 11 pm and 7 am, large public gatherings were discouraged, stores were closed at 5 pm. In addition, power was rationed 2 hours on, 2 off, between 7 am and 11 pm. The Maine Public Service system was divided in half for this purpose, and the halves fed alternately about 8,000 kw. The normal peak load of the system is 15,000 kw. A 1,000-kw diesel unit is to go into service on December 1.

Northern New England got 1.5 in. and southern New England 4 in. of rain from storms November 8 and 11. Rain was still falling in southern New England at mid-week (Nov 12). Observers predicted these rains would ease the tight water situation for at least a week. The New England Power System, it was reported, was serving all loads without curtailment.

Across the Canadian border, the Maine & New Brunswick Electrical Power Co, a Maine Public Service subsidiary, has been turning off power for one hour, thrice daily. The St. John River was so low that it could be waded. In Nova Scotia, conditions also were bad.

The Ontario Hydro-Electric Power Commission put a limited brownout into effect on November 10. The order restricted use of lighting for display, advertising, and other non-essential purposes and of electric heating devices in stores and offices. A penalty of $100 a day was set for violators, as provided by the Public Utilities Act.

In Missouri, the Union Electric Co has been using advertisements to sell its customers on conserving electricity. In St. Louis, both AFL and CIO union leaders have advised their members to cooperate if it is found necessary to replace day with night shifts.

Water Short? Not Here

Phenomenally heavy rains in an extremely strategic location in the Southeast have helped immeasurably in restoring the hydro capability there. At one location in western North Carolina, four storms in 27 days between October 7 and November 3 deposited 20.56 in. right where it could best drain into reservoirs of the TVA, Duke Power, Georgia Power and Carolina Power & Light systems. On November 11, another 3.94 in. fell there. A day later, it was "still raining," according to S. T. Henry, publisher of the *Tri-County News*, Spruce Pine, N. C.

Phillips B. Shaw Dies

Phillips B. Shaw, president of the Arizona Edison Co, Inc, died in a Phoenix hospital on November 10. He was 52 years old.

ONE OF THE SESSIONS at the 2nd International Lighting Exposition and Conference at the Stevens Hotel, Chicago

8,500 Attend 2nd International Lighting Exposition at Chicago

By Frank R. Innes

CHICAGO—Sellers, buyers, specifiers and installers of lighting fixtures and equipment, over 8,500 of them, thronged the 2nd International Lighting Exposition and Conference last week (Nov. 3-7). Careful control of attendance kept the proportion of "just lookers" very low, according to the 100 manufacturer-exhibitors.

Announcement of 200 winners in the Exposition-sponsored competition on "What Planned Lighting Can Do" featured the first day. Entries were descriptions of installations made in 1946 and 1947 with which competitors were directly concerned.

Success of the Planned Lighting Program will demonstrate the values of private enterprise, George Whitwell, Philadelphia Electric Co, told the Conference. If the program's appeal is carried to the user in terms of his own profit—as it is to the manufacturer, distributor, dealer, and utility—then that success is assured.

In the home of the future, there will probably be no fixtures or portable lamps; lighting will be built in, far beyond present conceptions in quantity and quality. This was part of the look at "Lighting Beyond Tomorrow" offered by Ward Harrison, General Electric Co. He foresaw wide use of the all-louver ceiling. Radically new light sources may be expected after the present period of refinement and improvement of fluorescent has run its course. Efficiency of light production can be raised about 70 percent.

Local effort will determine success or failure of the Planned Lighting movement. That was the central theme of addresses by Don Mitchell, Sylvania Electric Products, and J. S. Schuchert, Duquesne Light Co. Mitchell stated ten essentials for effective local activities: (1) planning according to local conditions, (2) adequate budgets, (3) coordination of local interests, (4) education and training of selling forces, (5) survey of the local market, (6) national promotional material supplemented by other material of definite local appeal, (7) enthusiastic sales personnel, (8) continuing publicity, (9) public support through thoughtful attention to the interests of groups, (10) carefully planned approach in each selling field.

It's time now for each person and element in the industry to get to work on Planned Lighting, said Schuchert. Preparation is finished; selling must start. The individual, locally, as salesman, contractor, and distributor, now must see and assume his responsibility for making the program click. Success rests on sales to individuals made by individuals up and down Main Street, in homes, and in factories.

The Illuminating Engineering Society is the engineering department of the lighting industry, according to L. E. Tayler, IES vice-president. Membership is drawn from all of the industry, not just from the engineers. Thus the Society is neither strictly professional nor entirely commercial, but a combination devoted to the best interests of both groups. Its activities cover both the purely technical field and broader commercial application of lighting equipment.

No longer may lighting equipment in public buildings sacrifice effective illumination for appearance. So stated Thomas F. Coghlan, electrical engineer of the U. S. Public Buildings Administration. PBA has comprehensive specifications for lighting fixtures in its buildings. The large quantities of fixtures required for new buildings, and for modernization of old ones, will justify the expense of tooling up for production on Administration specifications.

The second session of the Conference was closed by E. C. Huerkamp, Westinghouse Electric Corp, in a presentation of NEMA activities promoting Planned Lighting and other electric services. Thousands of newspaper clippings, pasted on a 185-ft roll of paper, evidenced the results of NEMA's publicity activities.

Electrical wholesalers should train their salesmen in Planned Lighting, maintain complete stocks, set up display rooms, cooperate with contractors and utilities in selling and installing modern lighting, and tie in with current promotion of street and highway lighting. This advice was given by D. L. Fife, Fife Electrical Supply Co, who

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said the lighting market is only one-quarter sold and urged that wholesalers be ready to do their part in selling the remainder.

Modern lighting multiplies the user's investment in fixtures and wiring facilities many times, said H. P. Litchfield, Graybar Electric Co. Therefore, the market is much larger than before the war. But this is definitely a buyers' market, and electrical wholesalers must be ready, with stocks and selling methods, to cope with it. This means better organization of business plans, better-trained salesmen, better operations throughout.

Production capacity of industry today is two and a half times what it was in 1939, J. M. McKibbin, Westinghouse declared. Selling that output will require trained salesmen. McKibbin described the Westinghouse training course for wholesalers' salesmen, and added that the Planned Lighting Program will only be as good as its salesmen.

Lighting is the foundation of the wholesalers' selling program, said O. Fred Rost, *Electrical Wholesaling*. By selling lighting, the wholesaler also will sell practically everything else he handles. And the market is tremendous; 80 to 90 percent of existing lighting installations are obsolete.

Contractor Has Responsibility

The contractor should guarantee satisfaction with every lighting installation; but he cannot do that unless all job elements are included in his contract, G. B. Roscoe, *Qualified Contractor*, said. For instance, he cannot take complete responsibility if fixtures and other equipment are sold direct. To do his part in the Planned Lighting Program, the contractor should have understanding of his problems and help in solving them from manufacturer, wholesaler, and utility.

Leo Gamp, Gamp Electric Co, said every lighting installation must be sold, designed, and engineered—the three operations in that order. They should be functions of the contractor but frequently are not. There are, he said, too many "lily" contractors who "toil not, neither do they spin." Instead, they wait for others to do the selling, designing, and engineering and expect the jobs to be laid in their laps. However, the contractor is not wholly to blame for this situation. His profit margin on fixtures and other equipment is narrow, and he cannot afford the expense of selling and engineering. Thus, a contractor has little incentive to expand his services. Wholesalers should share their margins with enterprising contractors who undertake creative selling and do competent engineering because their costs are thereby decreased.

Description of a successful fluorescent maintenance service in Washington, D. C., was given by W. W. Langston, Jack Stone Electrical Co. Cost of about $3 per lamp per year covers replacement, maintenance, cleaning; the customer has no other expense. The outlook is good for this kind of business if unions will approve employment of men of lower than journeyman grade. The rate for this grade of labor makes the operation unprofitable.

Speaking at the Exposition dinner, sponsored by IES' Chicago Section, Gerald Wendt, *Science Illustrated*, looked to a fixture-less future for lighting. Being comfortably far ahead, this picture did not alarm his audience. Profit realized from the dinner, it was announced, will be used by the Chicago Section to set up at the University of Illinois the first known scholarship in illuminating engineering.

Hurricane Doings

Florida Power & Light Co has reported the following damage to its distribution system as the result of the September hurricane: 930 poles broken, 2,052 poles leaning, 370 crossarms broken, 310 guys broken, 673 feeder spans down, 1,420 other primary spans down, 1,106 secondary spans down, and 1,384 spans to be resagged. Damage to the transmission system included 292 broken poles, 688 poles leaning, 118 crossarms broken, 309 spans to be resagged, and 273 insulators broken.

Iowa Utilities Must Pay 2% Use Tax on Equipment

Electric utilities in Iowa must pay the state's 2 percent use tax on poles, wires, transformers, pipes, and valves, the Iowa Supreme Court has ruled. The 4-to-2 decision was handed down in reversing a decision of a lower court favoring the Peoples Gas & Electric Co.

The utility claimed the equipment was exempt under a section which exempts property and equipment used in processing, manufacturing, or servicing of tangible property intended for ultimate sale at retail.

The use tax is the companion measure to the 2 percent retail sales tax and applies on property purchased outside Iowa for use in the state.

New Viewing Tube to Cut Cost of Color Television

Development of a new viewing tube for receiving television pictures in color was disclosed at the National Electronics Conference at Chicago last week. More than 2,500 engineers attended and heard the 78 technical papers presented. Over 50 manufacturers exhibited their products.

In discussing the new viewing tube, Arthur B. Brownwell, Northwestern University Technological Institute, explained that it differed from other color tubes in that it is the only system with a composite viewing tube and a single electron gun.

Called the Chromoscope, "it is a relatively simple all-electronic device and would add only a small cost to the present black and white television receiver," Professor Brownwell stated. "By coating three screens with a different phosphor which corresponds with the three primary colors, we have a composite image screen which enables the viewer to see the programs in natural colors. The three screens are optically superimposed upon each other but are separated by a microscopic distance and electrically insulated from each other."

William E. Shoupp, Westinghouse Research Laboratories, made it known that the company has launched a research campaign to find out what mysterious forces keep the core of matter from exploding like an atomic bomb. He continued, the answers could "be comparable in importance to the discovery and formulation of the laws of electricity."

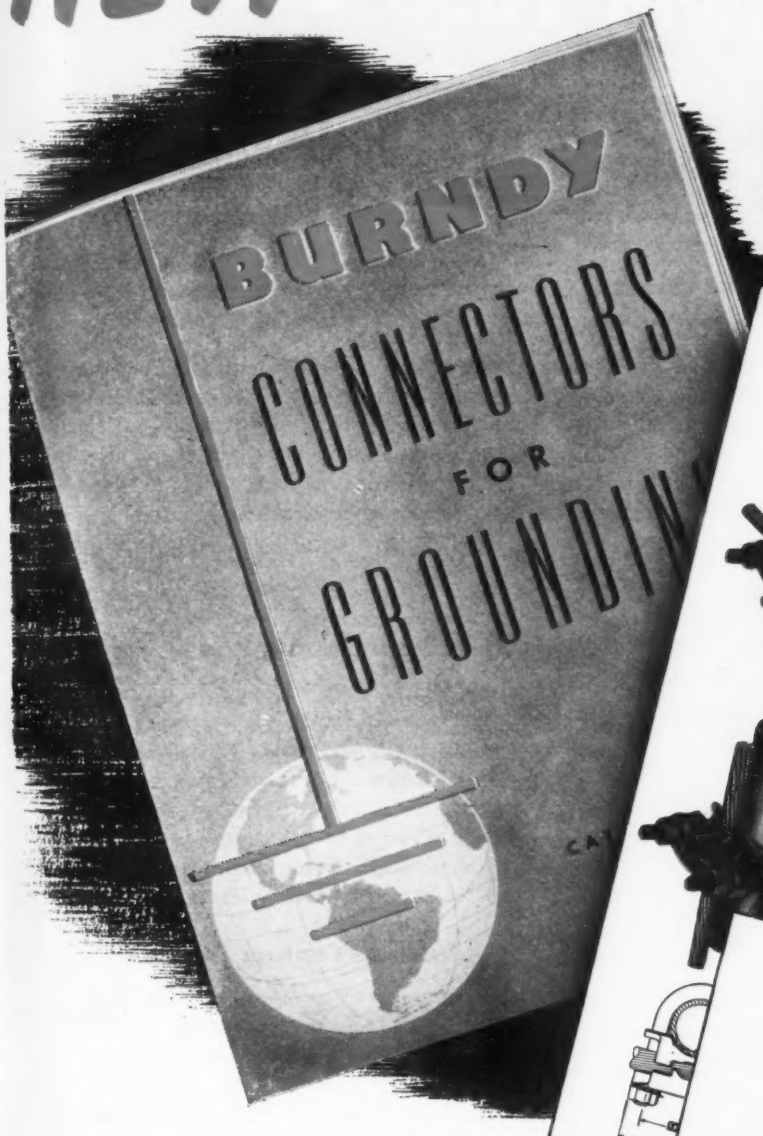
Newer thyratrons have distinct advantages over those developed before the war, A. W. Coolidge, General Electric Co, reported at the joint AIEE-NEC session. They were developed to embody quick heating, high peak-to-average current ratio, wide ambient temperature range, and high surge current rating for use particularly in motor control circuits.

Hilo Gets Tanker Unit

Hilo Electric Co has secured a 4,920-kw generating unit from the wrecked tanker, Fort Dearborn, and will install it in Hilo, second largest city in the Hawaiian Islands. The utility bought the stern half of the tanker with the unit from the War Assets Administration for $60,000. Installation costs will be $450,000.

The utility, like the others in the islands, has been greatly in need of extra capacity since the war drove up industrial demands. Permanent plants cannot be installed before 1950.

NEW GROUNDING CATALOG BY BURNDY



Simplified, 2 Bolt

2-WAY GROUND CONNECTOR

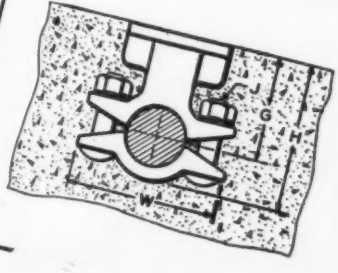
TYPE GAR

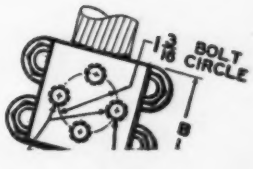
New design permits quick, easy installation of type GAR which connects ground bus either parallel to, or at right angles to rod or pipe. Connection requires merely tightening two nuts on the U bolt. High copper alloy cast body with silicon bronze U bolts, nuts and lockwashers permit burying entire connection without danger of corrosion.

For Grounding in Concrete

GROUND CONNECTOR GFJ

Makes connections for flat bar ground lead to ground cable embedded in concrete. Ground cable is laid and type GFJ ground clamps attached at desired intervals. A flat bar is bolted to the top of the connector which has been tapped for this purpose. Concrete floor is then poured over cable and connector leaving flat bar ground lead rising out of floor.





SEND FOR YOUR COPY

This new 32-page Burndy catalog is virtually a reference manual on grounding . . . furnishing not only complete, illustrated catalog data on all types of Burndy grounding connectors available, but also technical information, diagrams and charts on all phases of grounding. Copies are available to all those interested in grounding problems.

Connect with

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WESTERN BRANCH: Vernon 11, California • CANADA: Canadian Line Materials, Ltd., Toronto 13 • FOREIGN: Philips Export Corp., New York 17, N. Y.

These L-M Power Fuse Cutouts

handle 7.5 to 46 Kv. . . . 100 and 200 ampere ratings

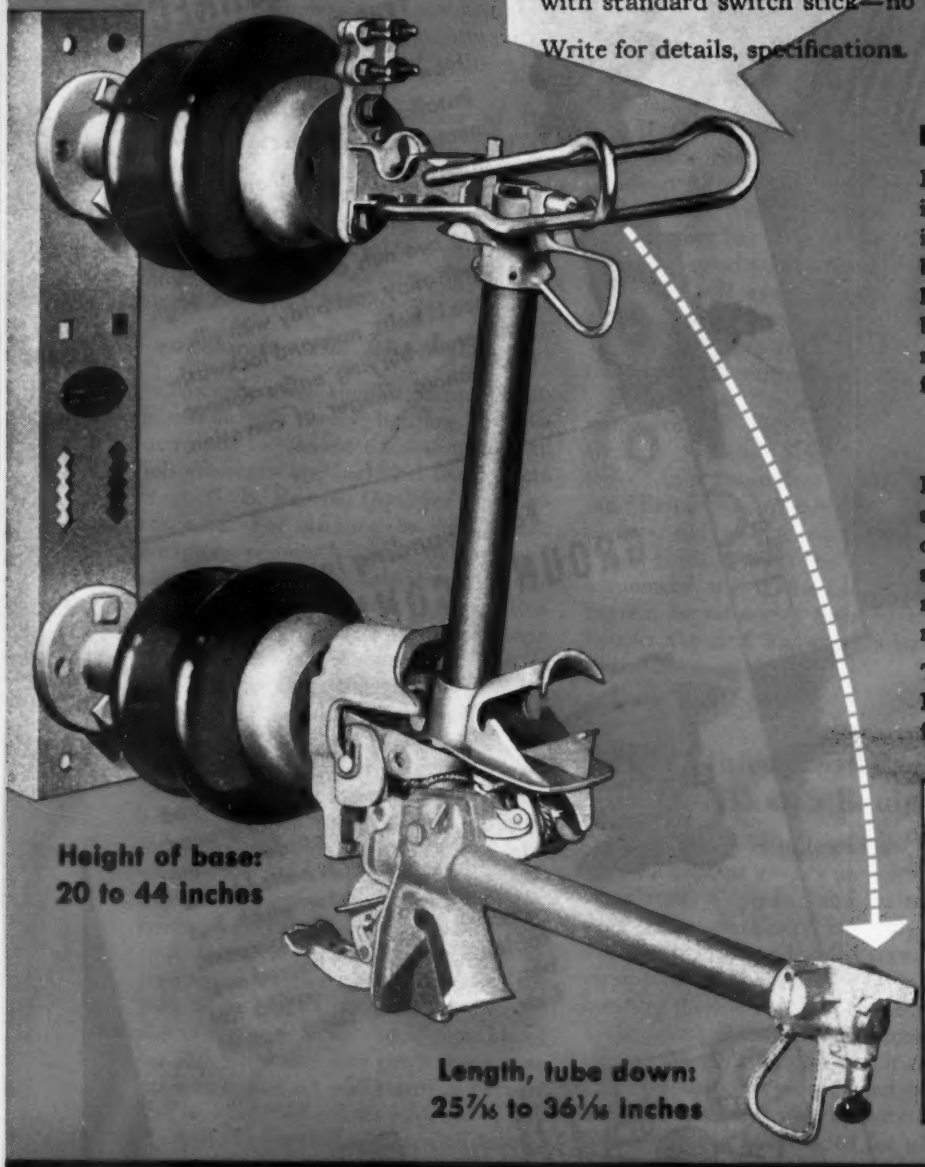
with interrupting capacities up to 6000 amperes

For heavy currents at or near substations . . . for transmission lines . . . wherever high voltage, high rupturing capacity cutouts are required.

A fuse cutout using standard field replaceable fuse links. Upper and lower venting. Simple, positive operation. Link flip-out release double lower hinge. No excessive strain on link. Unique wire spring contact design provides firm contact, free floating action with positive latch at top of tube. No shunts or other current transfer means. For re-fusing, cartridge can be lifted off hinge with standard switch stick—no tongs or special sticks needed.

Write for details, specifications. Line Material Company, Milwaukee 1, Wis.

Length, tube up:
20¾ to 31½ inches



Height of base:
20 to 44 inches

Length, tube down:
25⅞ to 36⅛ inches

L-M Replaceable Power Fuse Links

Field replaceable standard links similar in design and construction to types used in distribution cutouts. No cartridge to buy, no filler tubes to bother with. Links have tin fusible element; strain wire; butt-soldered to top button and lower rod terminal. Long fibre tube housing from button to flexible leader.

Cutaway view of 200 ampere link

Double-Venting Feature

Button closes top of cutout tube. Side spring contacts permit button to blow off under heavy shorts, releasing pressure at both ends of tube. Eliminates recoil and stresses on contacts and mountings.

Time current characteristics conform to NEMA "E" standard SG-11 for power fuse links.

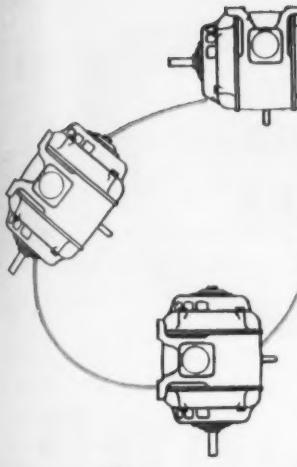
RUPTURING CAPACITIES

Voltage	Type HFO 100-amp rating	Type HXO 200-amp rating
7500 volts	4000 amps	6000 amps
15000	4000	6000
23000	4000	6000
34500	2000	4000
46000	2000	4000

LINE MATERIAL

FUSE CUTOUTS & FUSE LINKS

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • Wired Radio Control Equipment • Capacitors



Versatile mounting

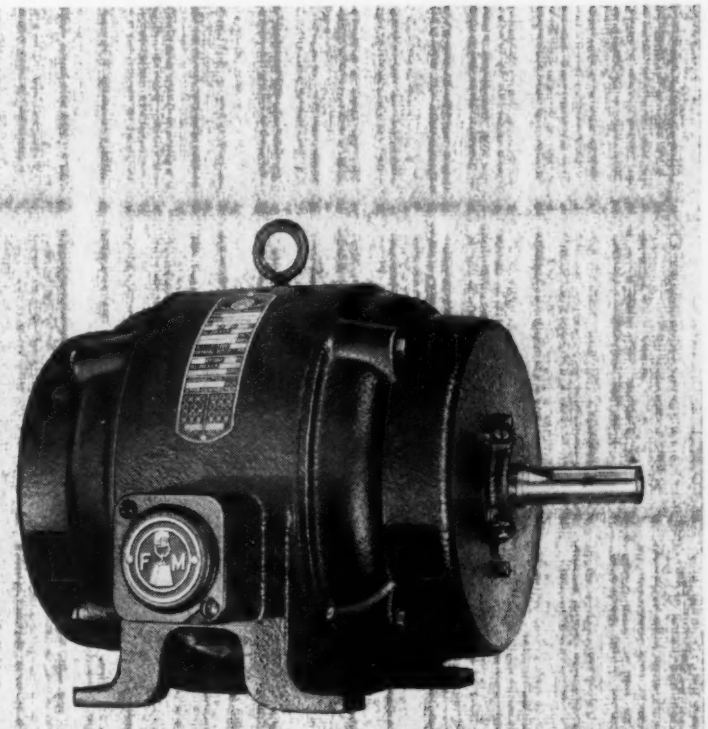
There's no position in which the Fairbanks-Morse general-purpose motor can't be mounted—and still retain its protective features.

The bearing brackets can be turned to four positions 90° apart, to place the air vents where desired.

Bearings are suitable for both vertical and horizontal mounting.

The frame can be reversed to put the conduit box on either side.

This versatility is just one of many reasons why this motor is worth your investigation. Fairbanks, Morse & Co., Chicago 5, Illinois.



Every good feature you could ask!

Copperspun Rotor Centrifugally cast in one piece—and of copper.

Protected Frame Excludes dripping liquids and falling particles.

Cross-flow Ventilation Provides uniform cooling—no hot spots.

Ball Bearings Sealed in and protected.

Recessed Conduit Box Permits neat installations in close quarters. Conventional box also provided.

Balanced Characteristics A 40° C. motor with high efficiency and power factor, and excellent starting and accelerating torques.

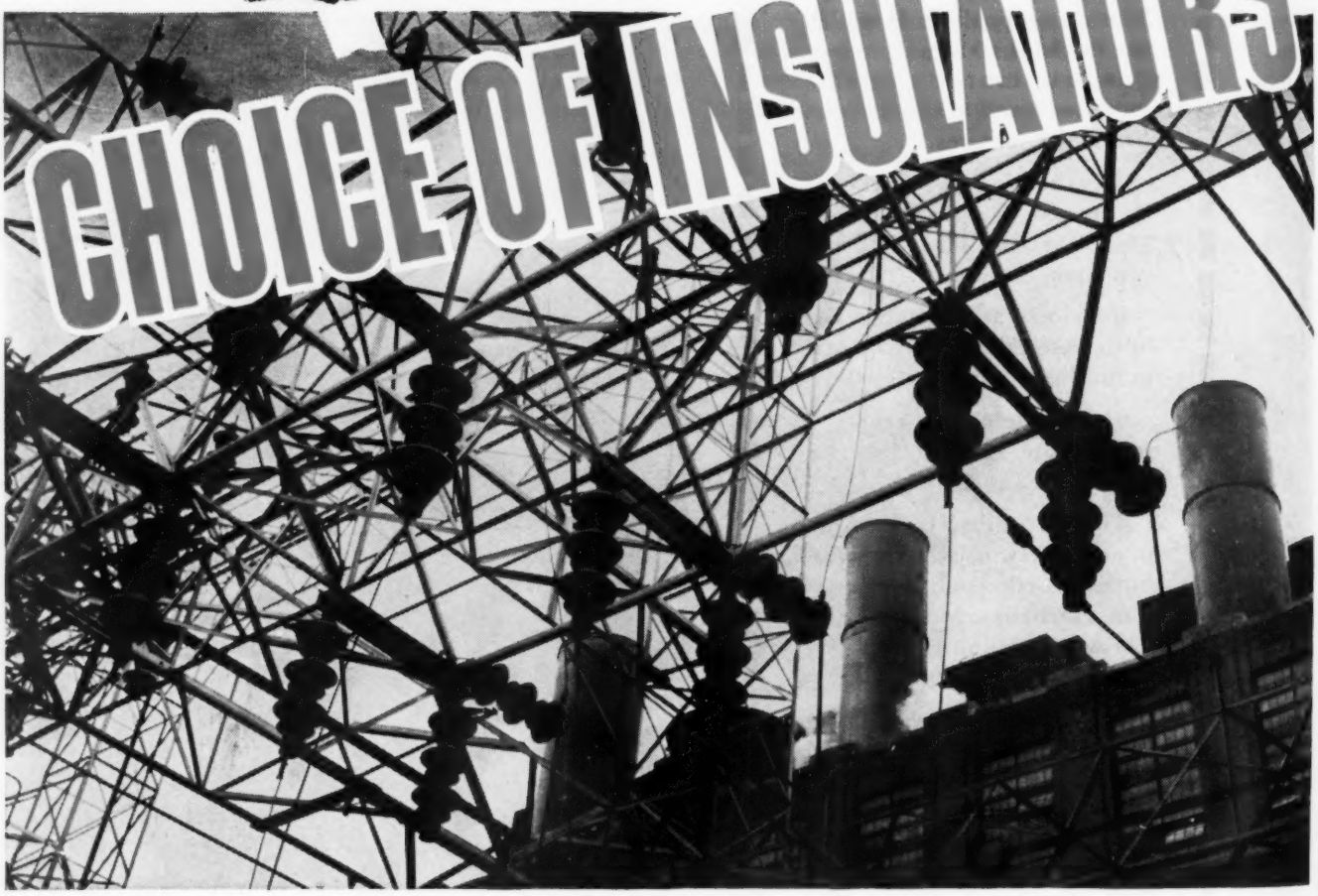
Fairbanks-Morse

A name worth remembering

Diesel Locomotives • Diesel Engines • Generators • Motors Pumps • Scales • Magnetos • Stokers • Railroad Motor Cars and Standpipes • Farm Equipment

"New" INSULATORS 20 YEARS OLD—
PROVE THAT THIS POWER COMPANY
Made a Sound

CHOICE OF INSULATORS



On a large Southern property they call these their "new" insulators! Now rounding out their 20th year, these O-B switch units are youngsters compared to a complete line and station on the same system that both date back to 1917, with their O-B insulation still in top-performing condition. . . But, after 20 years it means a lot to call an insulator "new". After almost a quarter of a century, these O-B insulators have bred a feeling of confidence in the men who work and live with them--a feeling that makes these men forget to count years, and call them "new". You will have the same kind of experience if O-B is *your* CHOICE OF INSULATORS.

Ohio Brass

2785-H

MANSFIELD, OHIO

CANADIAN OHIO BRASS CO., NIAGARA FALLS, ONT.

HEADQUARTERS FOR PORCELAIN INSULATION

Europe to Get Little Power Equipment despite Eager Pleas

Harriman Committee Believes 16 Nations in Marshall Plan Want too Much too Soon—European Manufacturers to Supply Most Electric Power Plant Equipment in Next Few Years

WASHINGTON — Europe wants too much too soon in the way of new capital equipment—including electric power production facilities. That was the major conclusion of the Harriman Committee on Foreign Aid in its report to the President last week (Nov. 8).

The Harriman report assured the U. S. electric power industry that Europe will not place any substantial orders for power equipment in this country for at least two years. And it warns Europe not to attempt to do so.

Taking its principal bite out of estimated expenditures for new industrial plant, the Harriman report substantially scaled down original estimates of the cost of the Marshall Plan to the U. S. In fact, it even went below the figures—$16 billion to $20 billion—presented to Congress this week by Secretary of State Marshall. The Harriman group recommended a four-year program of $12 to $17 billion, with $5,750,000,000 for the first year (1948).

Basis For Marshall Plan Funds

The Harriman committee originally was told to determine just how much economic aid the U. S. could "safely and wisely" give Europe. Its report will probably represent the administration's minimum demands for Marshall Plan funds.

The committee set the tone for its entire report by asserting that it doubted that the 16 nations participating in the Marshall Plan had been "wholly realistic in their plans for capital expansion." It pointed out that gross investment in capital programs in the U. S.—now "at the height of a boom"—is running about 17 percent of total production. In submitting their estimated requirements at Paris, some nations "attempted to exceed this rate," the report said.

Primarily, the committee found, power aspects of the Marshall Plan call for the bulk of the equipment to be produced in Europe. It frankly questioned Europe's ability to produce so much power equipment in four years. Also, it predicted the power program would drag on two or three years longer. But the committee felt such delay would not increase orders for U. S. equipment.

Chief "potential error" in the power section of the Paris report probably is its timing, the Harriman group held. In four years, the participating countries plan to add over 21,000,000 kw of capacity through projects undertaken in individual nations. This is the "national" power program. Most of this equipment is to be supplied by European manufacturers.

But "the consensus of those who are informed on European capacity to produce electric equipment" is that Europe's plants will require "six or seven years, instead of four," to produce this material.

Further, the projected rate of capacity increase—50 percent above Europe's 1947 consumption and almost double that of 1938—raises "serious doubt" as to whether power-consuming industries will expand sufficiently during the same period to "use all this energy effectively." Thus, Europe could "fall somewhat short" of its power program without endangering the broad objectives of the Marshall Plan.

The Harriman committee also was suspicious of the quantity of equipment required from the U. S. for the $300,000,000 "international" power program. This calls for an additional 2,300,000 kw of capacity, mostly hydroelectric, for projects serving more than one country. Equipment amounting to two-thirds of the total cost of these projects is requested from this country.

The Harriman committee recommended that these projects be carefully examined by "whatever agency is to do the financing."

In any event, the committee found, the amount of equipment required from the U. S. during the first two of the four years will be "so small as not to create any major difficulty." By the time European manufacturers have demonstrated whether they can or cannot handle their share of the program, it will be too late to divert orders to the U. S. and expect delivery within the four-year period. Thus, if the whole program falls behind schedule, it might require less, rather than more, American equipment, the committee reasoned.

The "national program" calls for delivery of some $300,000,000 of U. S. equipment, but "only a small part" would be electrical machinery. However, some of the diverse requirements, such as "valves, machine tools, and construction equipment," also are scarce in this country.

The Harriman committee conceded that considerable quantities of generating and distribution equipment may be required from the U. S. in 1950 and 1951. But, "given that much notice," American manufacturers should be able to meet this demand "without serious inconvenience to electric power consumers in this country."

HUGH GAITSKELL who has succeeded E. Shinwell as Minister of Fuel in the British Cabinet

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North American Co Will Distribute Utilities Stocks

The North American Co will distribute to its stockholders of record of November 26 approximately $63,000,000 of subsidiary company stocks. The distribution will be one of the largest single liquidations to be made under the Public Utility Holding Company Act. The Securities and Exchange Commission must approve the distribution.

For each 100 shares of North American common stock outstanding, 19¼ shares of Wisconsin Electric Power Co common and 21 shares of Potomac Electric Power Co common will be given. In lieu of fractional shares of the utilities, cash will be given.

North American has already eliminated these four major utility companies as subsidiaries: Detroit Edison Co, Pacific Gas & Electric Co, St. Louis County Gas Co, and Cleveland Electric Illuminating Co. It still controls Union Electric Co of Missouri, North American Light & Power Co, and North American Utility Securities Co.

500-Kv Transmission Line Symposium Held by AIEE

Experiments at Tidd Station Acclaimed as Marking New Era in Transmission Technology—Manufacturers Represented at Chicago Meeting—Generating Problems Are Discussed

By Archer E. Knowlton

CHICAGO—Institution of the 500-kv line tests at Tidd Station marked a new era in transmission technology. This was the consensus of those who attended the symposium of seven papers at the AIEE Midwest General Meeting (Nov 3-7).

The comprehensive disclosures* and discussions confirmed the intention to have the studies answer the technological and economic feasibility of meeting future loads by resort to another large jump in voltage.

Tribute was paid to Philip Sporn, his associates, and the manufacturers collaborating with the American Gas & Electric Service Corp in resolving the two principal realms of doubt—namely control of corona losses and justification for tempering of the insulation levels for such prospective voltages as 345 or 460 kv.

Other high points of the sessions were the symposium on probability methods of determining requisite generating reserves and the discussions of storage batteries for switchgear control.

Industry owes Sporn and his collaborators a debt of gratitude for undertaking so comprehensive a program and for disclosing the details so promptly and completely, said W. S. Peterson, Los Angeles Department of Water & Power. Anomalous behavior of corona on the Hoover Dam 287-kv lines remained unexplained by consideration of the recognized effects of air density, temperature, humidity, etc, and he hoped that the comprehensive data presaged by the tests at Tidd Station would resolve the problem. Peterson's own formula for corona was frequently cited by others as the most authentic index so far available, and he welcomed the extension promised by the impending experiments.

The forthcoming tests were deemed most opportune and wise by D. M. Jones, General Electric Co, in a discussion given by S. B. Crary, also of GE. He pointed out that transmission costs can be reduced when overvoltages are limited by judicious design and apparatus, in distinction to acceptance of unlimited overvoltages and the use of correspondingly high insulation levels. Recent progress in the technology of transmission warranted the confidence that higher voltages can be adopted with certainty of performance and economic gain.

Confidence was expressed by K. B. McEachron, General Electric, that the collaborative venture would evolve the desired data and much more not now foreseen. He emphasized that the program marks a turning point in that lightning no longer determines the insulation level. Conparatively few companies have begun to sense the economic wisdom of combining the protection of the arrester with a transformer of reduced insulation level. From this viewpoint, the Tidd Station program marks the beginning of an era even if the higher voltages are not substantiated or used.

The amazing confidence with which this 550-kv exploration was approached in comparison with the initiation of the 132-kv, 230-kv and 287-kv lines was pointed out by R. T. Henry, Niagara Hudson. However, he reminded that higher voltages would need much larger line loadings to support them and it would be necessary to devise means to sustain such loadings during the inevitable outages.

The prediction of Elmer Lindseth, Cleveland Electric Illuminating Co, on electrical growth and the growing difficulty in acquiring rights-of-way were both cited by A. C. Monteith, Westinghouse Electric Corp, as added justification for the 500-kv tests. He interpreted them as a search for the smallest conductor and least spacing, the two factors most conducive to lowest practicable cost for bulk transmission. Monteith foresaw the day when loading lines to tolerable corona limits would be as common as the prevailing practice of loading transformers to warrantable temperatures.

Omission of mention of high-voltage d-c transmission was due, said E. L. Harder, Westinghouse, to a general conviction that it does not offer comparable promise for American requirements. Existing 60-cycle distribution and utilization systems preclude many of the possible academic alternatives to 60-cycle transmission.

Concurrence on corona and insulation as dominant factors in the justification of extra-high-transmission voltages was registered by Francois Cahen in citing the preliminary data already indicated by studies in progress in Paris. The six 220-kv circuits from hydro in southern France to the northern loads 300 miles away would need to be duplicated in a very few years. Further urge for adoption of about 400 kv lies in the contemplated European interconnection. Dual conductors have already been installed as a step in corona control. Up to 160 kw per mile under adverse conditions of weather and conductor weathering are indicated with as low as 1 kw for most advantageous conditions.

Decision on lower insulation levels for

ELECTRIC STORAGE BATTERIES on the railroad and in the industrial plant and central station must be properly maintained, stated R. I. Fort, left, Illinois Central RR; V. E. Schossberg, Inland Steel Co, and E. A. Hoxie, Electric Storage Battery Co, at the Midwest general meeting of AIEE

*A digest of the seven papers appeared in the November 8 issue of ELECTRICAL WORLD. News of the energizing of the 500-kv test lines appeared in the issue of October 11, Page 84.

arresters means better protection at lower cost, said convalescing M. M. Samuels in comment read for him by Lee M. Moore, of L. T. Klauder & Associates, Philadelphia. Samuels considered the 500-kv test program a milestone in transmission technology and complimented the manufacturers in subscribing to a reduced level of insulation.

Optimum economy and reliability alike demand a high degree of rationalization of insulation coordination, said P. L. Bellaschi, consulting engineer. He ventured that further improvement in equipment and protective measures might well warrant still more reduction in insulation levels for such high voltages. In any event, the lesson learned from the higher voltage studies will be available for application at prevailing voltages.

Concern about the dearth of information about radio interference was expressed by G. R. Sleman, of the Hydro-Electric Power Commission of Ontario, in conjunction with citing some data on corona with impressed d-c. Optimum spacing from the interference standpoint appears to be less than prevailing values. He added that certain conductor coatings look promising as correctives.

The increased sizes of transformers also demanded would, according to F. A. Lane, American Gas & Electric Service Corp., tax the ingenuity of the designers to keep them within transportable dimensions.

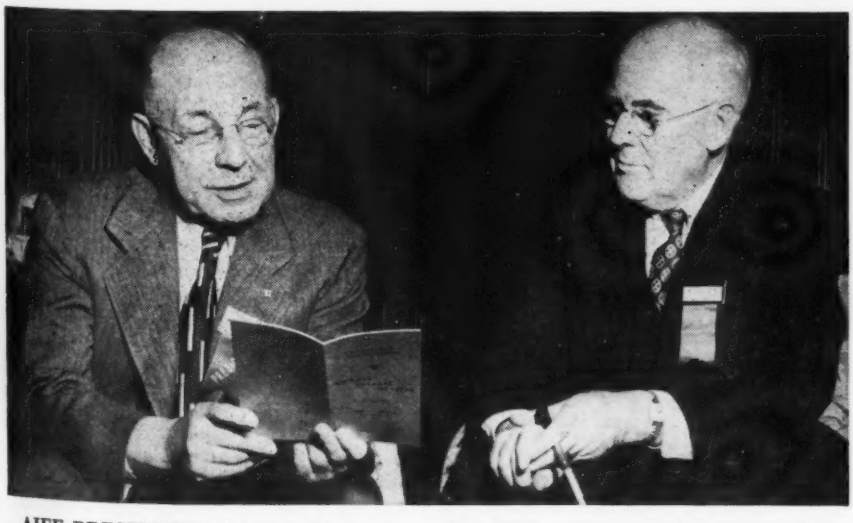
Four papers applied the mathematics of probability to the calculated likelihood of generating capacity outage and to the judicious provision of reserves. The authors were Guiseppe Calabrese, Consolidated Edison Co; W. J. Lyman, Duquesne Light Co; Howard P. Seelye, Detroit Edison Co, and E. S. Loane and C. W. Watchhorn, Pennsylvania Water & Power Co. They were all acclaimed as enhancing the practicability of applying probability analyses to determination of the reserves needed when the present crisis is passed.

Issue was taken, however, with the definition of dependable hydro capacity in the latter paper. Dependable hydro was defined as the "amount of steam capacity that would be required to maintain the same degree of reliability in the absence of the hydro capacity." The contention of R. L. Ashley and L. T. Anstine, Consolidated Gas, Electric Light & Power Co, was that such equivalance does not exist. Also, the proposed method of combining the effects of variable steam flow with planned and forced outages leads to an untenable evaluation of hydro capacity. Steam installations, they contended, have to be planned to meet worst rather than best or even average river flows.

The all-steam system has a relatively uniform probability of outage whereas the steam-hydro has an inherently higher probability of failure during seasons when low flows are experienced. Further, a failure to carry the load on a hydro-steam system is not likely to develop as suddenly or unexpectedly as on an all-steam system, but it will extend over several hours each day for several weeks.

Blake D. Hull, Institute president, set the theme for the meeting in his keynote address, "Ceiling Unlimited." "Everything about the power business is growing in magnitude. Voltages are

PARTICIPANTS in 500-kv test line symposium at AIEE meeting at Chicago. Top panel, front row, left to right, Anthony Wagner, American Bridge Co; M. E. Noyes, Aluminum Co of America; I. W. Gross and Philip Sporn, American Gas & Electric Service Corp; A. C. Monteith and C. F. Wagner, Westinghouse Electric Corp; and D. M. Simmons, General Cable Corp; rear row, R. L. McCoy, Locke Insulator Corp; L. F. Hickernell, Anaconda Wire & Cable Co; J. M. Sheadel, Ohio Brass Co; and E. L. Peterson, AG&E. Bottom panel, left to right, front row, E. Beck, Westinghouse; G. D. Lippert and F. A. Lane, AG&E; and B. W. Wyman, General Electric Co; rear row, R. L. Tremaine, J. K. Hodnette, and P. L. Bellaschi, Westinghouse



AIEE PRESIDENT Blake D. Hull, left, and F. H. Lane, general chairman of the AIEE convention at Chicago, discuss the program before the opening session

increasing, consumption is increasing, and with these, come new and greater engineering problems. In fact, there is an unlimited ceiling for the electrical engineer in properly applying equipment to solve the production problems of the day. We have our problems in education, we have our problems in society, but these too will be solved successfully when we approach them in a pure engineering manner. Our skies are clear and our ceilings are unlimited," he concluded.

B. F. Thomas, Jr, in presenting the first interim report on interior wiring design for commercial buildings, declared that its purpose is to present a sound basic treatise on well-designed wiring systems for this type of building. He emphasized that the value of the completed report will be enhanced greatly if members contribute load data.

L. E. Fisher, BullDog Electric Products Co. explained a new method of figuring short circuit calculations on low-voltage distribution systems. D. L. Beeman, General Electric, discussed the problem of supplying power to air-conditioning equipment in commercial buildings.

Larger Batteries Needed

In order to provide from a battery the 112.5 volts at the switchgear terminal which the manufacturers are now advocating, E. A. Hoxie, Electric Storage Battery Co. said that in some instances, it may be necessary to install a set from one and a half to five times the size previously used to deliver 90 v. Two alternatives mentioned were the redesign of the operating mechanism and the increase of copper in the control circuit.

V. E. Schlossberg, Inland Steel Co, in discussing the care and maintenance of storage batteries in relation to the steel industry, said battery life had been increased from 36 to 62 months on units used on industrial trucks. A definite time schedule for inspection was given as the most important factor in obtaining this added life.

Discussing the same problems as they relate to the railroads, R. I. Fort, Illinois Central RR, emphasized that loads in passenger cars have risen from 1 to 25 kw. In dining cars using electrical kitchen equipment they have increased to 40 kw. This factor necessitates not only larger batteries but also higher distribution voltages. Many cars are now being built with 112-v systems.

A directional overcurrent electronic relay has both twice the sensitivity and twice the speed of conventional relays, R. I. Ward, Commonwealth Edison Co, revealed. He declared that if this type of protective equipment is designed strictly from an engineer's viewpoint, it will have two main advantages over present relays—minimum of moving elements and wider choice in selection. J. H. Kinghorn, AG & E Service, said electronic relaying, in order to gain acceptance, must have: (1) greater reliability or freedom from trouble, (2) greater accuracy, (3) faster performance, (4) savings, either through initial cost or reduced maintenance, (5) ability to perform functions not otherwise possible.

CANADIAN MEMBERS, led by G. D. Floyd, center, consider possible Canadian applications of high-voltage transmission lines

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New Worcester Unit

Worcester County Electric Co, a subsidiary of the New England Electric System, has ordered a new 30,000-kw steam turbo-generator for installation in a new building adjacent to its Webster Street Station.

MEETINGS

California Municipal Utilities Association—Annual Conference, Hotel Senator, Sacramento, Calif., November 19-21. F. V. Frey, secretary, Room 108, City Hall, Pasadena 1, Calif.

Pennsylvania Electric Association—Meter Committee, Benjamin Franklin Hotel, Philadelphia, December 11-12. R. A. Black, chairman, West Penn Power Co, Connellsville, Pa.

Canadian Electrical Association—Winter Conference, Chateau Frontenac, Quebec, January 12-18. B. C. Fairchild, managing director, Room 704, Tramways Building, Montreal 1, Canada.

American Institute of Electrical Engineers—Winter General Meeting, William Penn Hotel, Pittsburgh, January 26-30. H. H. Henline, secretary, 29 West 39th St., New York 18, N. Y.

Previously Listed

American Society Of Mechanical Engineers—Annual Meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, December 1-5.

Gas from Cable Insulation Explodes in Service Vault

Shortly before 11 pm, October 31, an electrical short circuit and explosion occurred in the vault supplying service in the basement level of the RCA Building, New York City.

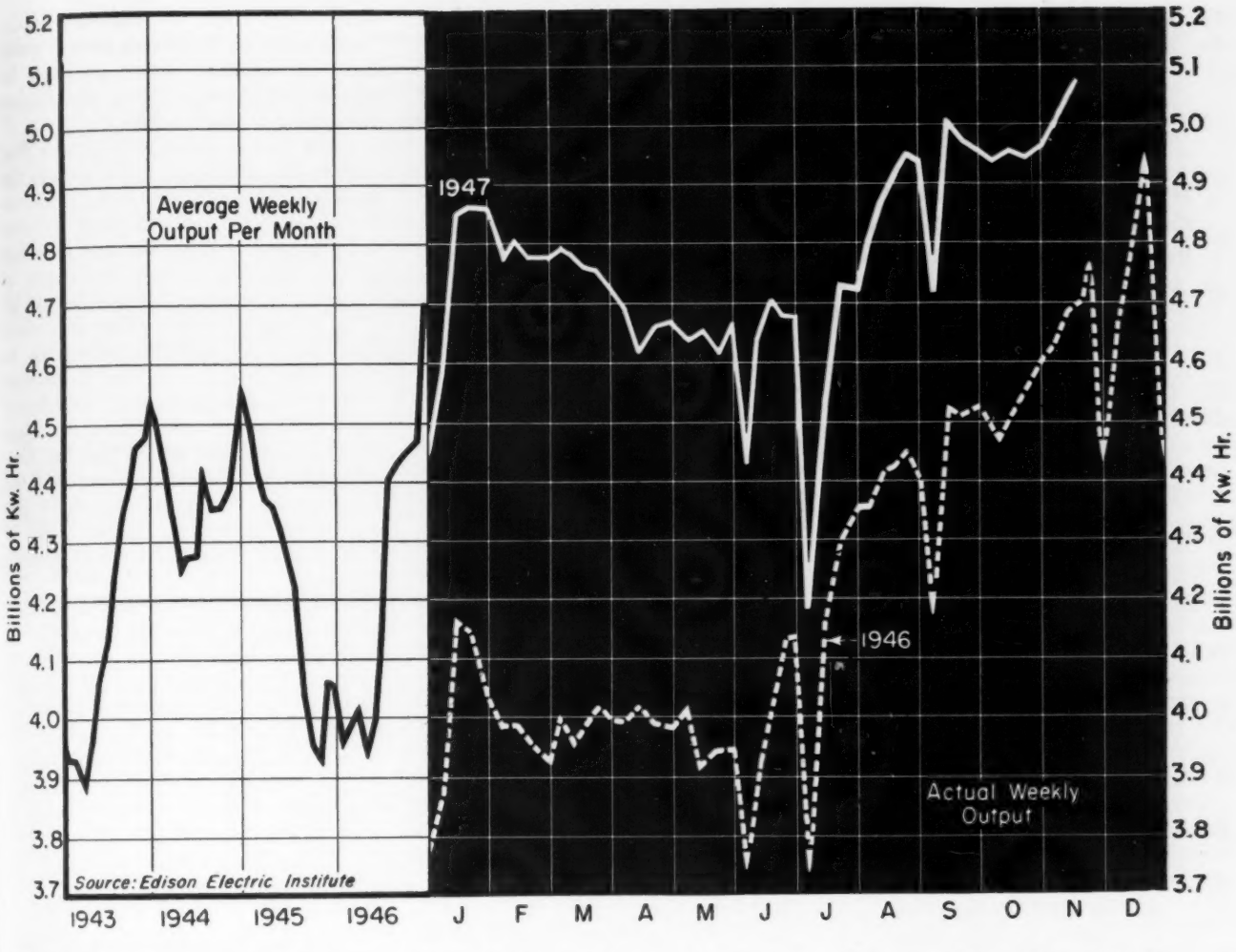
First indication of trouble was at 10:48 pm when a network feeder opened automatically at a generating station of Consolidated Edison Co. This feeder supplied transformers in the basement and the 21st floor vaults of the RCA building as well as other locations. Two minutes later a report was received of an explosion at West 50th St near Sixth Ave.

In the basement level vault under the sidewalk, transformer banks are separated by brick walls. Network switches and service buses are isolated by brick walls and doors.

The short circuit apparently started on the secondary cables between a transformer and its associated network switch. Gas distilled from the cable insulation exploded and blew down part of the brick walls in the network switch compartment. Damage was confined within the concrete vault structure.

No transformer was damaged and there was no oil fire as reported in some news accounts. The primary feeder failure apparently was caused by external damage and occurred in the network switch compartment on the spur connected to the 21st floor vault.

Service to the building was not interrupted because the service buses were isolated automatically from the trouble by the limiters blowing on the cables between the network switches and service buses.



Mountain States Utilities Add to Plant Capacity

Capacity of the Utah-Idaho-Montana utility companies will be increased 185,000 kw by 1950 with an additional 100,000 kw on the planning boards, George M. Gadsby, president of Utah Power & Light Co, told the first annual conference of the Intermountain Electrical Association at Ogden last week. The combined capacity of Idaho Power Co, Montana Power Co. and Utah Power & Light will be 900,000 kw with a probable combined load of 850,000 kw.

Attacking the political shibboleth of "cheap electric power" and the need for it in Utah, Gadsby proved that state and local taxes and increased wage rates were of far greater importance to industry. Taxes in Utah increased 100 percent between 1940 and 1946, he said. A wage increase of 1 cent per hour would cost the average Utah manufacturer $1.221 per year, he indicated. Power rates have decreased 9 percent. "The quickest way to secure cheap industrial power would be for the state to cease taxing the private utilities and make provision for the payment of their federal income taxes through some other source, applying the saving to industrial power," he said. Relieved of taxes and interest charges, his company could sell industrial power for 7.5 mills per kwhr he said, as against TVA region average industrial rates of 7.86 mills.

Ralph Gale, general sales manager, Idaho Power Co, told the conference Utah farmers would purchase $6,000,000 in electrical goods and equipment in 1948. His estimate included $4,650,000 in appliances, $250,000 in electrically powered farm equipment, and $1,100,000 in wiring installations, mostly in new buildings.

George C. Tenney, acting editor of ELECTRICAL WORLD, predicted four to five years of unexcelled electrical business for the industry.

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Line Contract Awarded

The Bureau of Reclamation has awarded a $587,383 contract to the Abbott Electric Co, San Francisco, for the construction of the first lap of the California Central Valley project. Two 25-mile parallel 230-kv transmission lines will be built from Shasta switchyard to Cottonwood and two one-mile tap lines from Keswick Dam to the main line. The lines will be on the west side of the Sacramento River.

Output Hits New High

A new high for electric output was reached during the week ended November 8, 1947, according to figures released by The Edison Electric Institute. The amount of electrical energy distributed by electric utilities totaled 5,057,455,000 kwhr, an increase of 8.0 percent over the 4,682,085,000 kwhr reported for the corresponding week of 1946. The previous high was 5,053,300,000 kwhr for the week ended September 13, 1947. During the week ended November 1, 1947, output was 5,009,286,000 kwhr.

Weekly Output, Millions Kwhr

1947		1946		1945	
Nov. 8	5,057	Nov. 9	4,682	Nov. 10	3,948
Nov. 1	5,009	Nov. 2	4,628	Nov. 3	3,899
Oct. 25	4,964	Oct. 26	4,602	Oct. 27	3,937
Oct. 18	4,946	Oct. 19	4,540	Oct. 20	3,915
Oct. 11	4,958	Oct. 12	4,495	Oct. 13	3,931
Oct. 4	4,935	Oct. 5	4,478	Oct. 6	4,028
Sept. 27	4,956	Sept. 28	4,518	Sept. 29	4,039
Sept. 20	4,977	Sept. 21	4,507	Sept. 22	4,019
Sept. 13	5,053	Sept. 14	4,521	Sept. 15	4,106
Sept. 6	4,721	Sept. 7	4,184	Sept. 8	3,909

Percent Change from Previous Year

	Nov. 8	Nov. 1	Oct. 25
New England	+ 9.7	+ 9.1	+ 8.7
Mid-Atlantic	+ 8.7	+ 7.7	+ 6.5
Central Industrial	+ 9.5	+10.9	+ 8.6
West Central	+11.3	+11.7	+10.8
Southern States	+ 7.2	+ 8.4	+ 9.0
Rocky Mountain	+ 6.6	+ 5.4	+ 9.8
Pacific Coast	+ 3.8	+ 2.6	+ 4.4
Total United States	+ 8.0	+ 8.2	+ 7.9

2 Switchgear Manufacturers Announce Merger as of Nov. 1

I-T-E Circuit Breaker Co Acquires Railway & Industrial Engineering Co—Both Firms Will Continue Operating under Present Names—No Plant or Product Changes Will Be Made

(See Front Cover)

THE I-T-E Circuit Breaker Co acquired the Railway & Industrial Engineering Co as a subsidiary November 1. This announcement was made in Philadelphia last week by W. M. Scott, Jr, president of I-T-E, and B. W. Kerr, president of R&IE.

Amalgamation of the companies, effected through a transfer of stock, unites two major manufacturers of electrical switchgear whose apparatus lines are supplementary. I-T-E's business, which is expected to gross over $17,000,000 this year, has been built largely around indoor air-circuit-breakers up to 5,000 v as well as metal-clad switchgear for power station auxiliary service and industrial distribution systems. R&IE business has been chiefly high-voltage, outdoor switching apparatus in the range between 5,000 and 287,000 v.

The I-T-E plant at Philadelphia and the R&IE plant at Greensburg, Pa., will continue to make their present products. R&IE will continue to operate under its established name with its present management personnel "virtually unchanged." Scott will be president of both companies. B. W. Kerr, formerly president, and K. S. Nevin, vice-president, treasurer, and general manager of R&IE, have been made directors of I-T-E. In addition Kerr will be chairman of the executive committee of I-T-E's board, as well as chairman of the board of R&IE.

Decentralization Desirable

Explaining that it is not I-T-E's plan to consolidate the two factories into a single large plant, Scott pointed out that industrial decentralization is going on all over the country. "Many companies are spending important money to achieve the advantages of decentralization. With the acquisition of R&IE, we have inherited a diversified manufacturing set-up."

This diversity goes beyond physical plant, Scott said. He explained that the merger would benefit both companies technically through the exchange of "know-how" and engineering skill. "I feel that this will permit us to turn out better equipment and more of it. We will be more efficient employers, and we will be able to produce the best possible equipment with the least effort."

Scott indicated that the merger will make it possible for the two plants to acquire and operate joint facilities—particularly for testing. Neither has felt this practical up to now.

There are now no plans to expand the merged companies through the addition of new departments or the introduction of new product lines. Some new products may be added later, but these will be "normal" additions, not growing out of the consolidation.

No immediate changes in the distribution organization of either company is contemplated. "In this connection, we plan to follow an evolutionary rather than a revolutionary course," Scott said. He pointed out that when I-T-E absorbed the Automatic Reclosing Circuit Breaker Co in 1935, there were two sets of field representatives. No immediate changes in distribution organization were made then. In the intervening years, however, there has been a gradual consolidation. Then as now, he pointed out, "we need the distribution specialists in the two lines."

R&IE was founded in 1910. Its first factory was at Ligonier, Pa., where the company produced high-voltage disconnecting switches for outdoor utility service. Since that time, the company has grown steadily. Today its plant at Greensburg employs 750 people, and its 1947 estimated gross sales will total upwards of $6,000,000, according to Kerr. The company confined its production exclusively to outdoor switchgear until 1927 when it purchased the Electrical Development & Machine Co. One of R&IE's major contributions was the development of the isolated-phase bus system for generating stations. This is now a major element of the company's business.

I-T-E was founded in 1891 as the Cutler Electrical & Manufacturing Co. In 1928, the company's name was changed to the I-T-E Circuit Breaker Co. Its early activity was built around 600-v air-circuit-breakers employing the inverse-time-element tripping principle which it introduced and on which the company's I-T-E trade mark is based.

COMMANDER John H. Geyer of the destroyer escort, *Maloy*, looks over the cables rigged on deck which will be connected with shore transmission lines at Portland, Me.

South Carolina Power Co Sold to Neighboring Utility

The South Carolina Electric & Gas Co has purchased the South Carolina Power Co from the Commonwealth & Southern Corp. The sale must still be approved by stockholders of Commonwealth & Southern and by the South Carolina Public Service Commission.

The Federal Power Commission ordered the sale when it approved the consolidation of Commonwealth's other properties into the Southern Co.

Under the terms of the agreement made last week (Oct 28) by Commonwealth's directors, it sold its 800,000 shares of South Carolina Power for $10,000,000. A $500,000 down payment was made. The remainder is due January 6, 1948.

If the sale is approved, the utility will serve 21 counties in central and southern South Carolina.

John H. Pilkington Dies

John H. Pilkington, assistant to the purchasing agent of Consolidated Edison Co of New York, Inc, and for a number of years active in the American Institute of Electrical Engineers, died suddenly at his Manhasset, L. I., home on November 10. He was 49 years old.

MANUFACTURERS & MARKETS

New Performance Standards for 3-Phase Squirrel-Cage Motors Issued by NEMA

New standards covering performance for industrial-type, integral-horsepower, 3-phase, squirrel-cage induction motors of 1 to 200 hp have been announced by the National Electrical Manufacturers Association.

These standards are of unusual significance to the industrial motor user, according to F. J. Geiger, Allis-Chalmers Manufacturing Co, who discussed them recently with press representatives in New York City. In his capacity as vice-chairman of the Integral Horsepower Subsection of the NEMA Motor and Generator Section, Geiger said the standards provide a sound basis for selecting the right motor for any industrial application, simplify the specification of minimum acceptable limits of operating performance, and assure interchangeability of motors made by different manufacturers.

The new performance standards will become effective January 1, 1948. They define five basic types of integral polyphase induction motors, designated Design A, B, C, D, and F, each of which offers a different combination of torque, speed, and current characteristics to meet the operating requirements of various industrial applications. The recently retired chairman of the Motor and Generator Section, C. P. Potter, Wagner Electric Corp, St. Louis, described the five motor types and summarized the relative performance characteristics listed in the new standards (see table). Then M. S. Hancock, Westinghouse Electric Corp, who is vice-chairman of the Section's General Engineering Committee, discussed the performance characteristics which enter into the definition of these types—starting and breakdown torques, locked-rotor current, and slip—and the differences in design and materials used to obtain various values for each.

A variety of motor designs has been developed to meet different industrial application requirements. With that idea as a guide, the term "Design" is used for performance designation, at the same time avoiding confusion with "class" for insulation.

The new NEMA standards are unusually significant, stated Geiger, because they place in the hands of the industrial purchaser for the first time:

1. A ready means of specifying minimum acceptable limits of operating performance.

2. A means of being assured that motors made by various manufacturers will each start and drive the purchaser's load in a satisfactory manner.

3. An assurance that motors built to these standards will be acceptable to most of the power companies to whose lines they may be connected.

4. A clear definition, and therefore a comparatively easy selection, of five different electrical types to meet the varying types of loads encountered on differently driven machines.

Relative Performance Characteristics

Design	Torque: Locked-Rotor	Torque: Breakdown	Locked-Rotor Current	Percent Slip
A	Normal	High	High	Less than 5*
B	Normal	High	Low	Less than 5*
C	High	Normal	Low	Less than 5
D	High	Low	Low	5 or more
F	Low	Low	Low	Less than 5

* Motors with 10 and more poles may have slip slightly greater than 5 percent.

A DISPLAY of a-c measuring instruments is viewed by guests of the Weston Electrical Instrument Corp at opening of new laboratories at Newark

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Electric Power Equipment Corp Now Reorganizing

Electric Power Equipment Corp, Philadelphia manufacturers of switchgear, announced this week that it has filed a plan of corporate reorganization under Chapter X of the Chandler Act, effective October 31.

The corporation will consolidate its commercial refrigeration and air-conditioning division in order to increase its production facilities and capital available for the manufacture of its established line of electrical switchgear.

Under the reorganization program the company plans to close its Greenwood, Del., plant which produced commercial refrigeration equipment and transfer those production facilities to its two Philadelphia factories. This equipment will be used to increase production of the company's switchgear products, it was stated.

While the commercial refrigeration and air-conditioning lines will not be dropped, the management announced that it will restrict the manufacture of this apparatus to substantially reduced levels.

Under the reorganization plan management personnel of the company will remain unchanged.

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GE Again Aids Research

Aid to college and university graduates who wish to undertake or continue research work in scientific and industrial fields has been announced by the

General Electric Co for the 24th consecutive year. Applications now are being accepted for the scholastic year 1948-49 for grants under the $1,000,000 GE Educational Fund, from the income of which the fellowships are awarded, W. W. Trench, company secretary and chairman of the Education Committee, stated. The fund provides more than $15,000 annually for research fellowships.

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Southern States Equipment Buys Henderson Foundry

Southern States Equipment Corp, Hampton, Ga., has acquired the Henderson Foundry & Machine Co. The new organization will operate under Southern States firm name, according to Olan Richardson, president. Southern States has been operating the foundry for the past seven years. The engineering staff has been greatly increased and the facilities of the entire plant have been expanded to keep up with production requirements.

Prior to moving all of its facilities to Hampton in 1945. Southern States took over the foundry properties in 1940 for the production of ordnance material. Under the new set-up Southern States is provided with a complete textile, mechanical and electrical engineering and manufacturing and construction service.

Officers of the company are Mr Richardson, president; W. C. Mitchell, vice-president and treasurer; H. A. Stewart, secretary; C. W. Walter, sales manager of the textile division, and T. A. Burdeshaw, sales manager of the electrical division.

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RCA Victor Gets Citation

RCA Victor Division of the Radio Corp of America, Camden, N. J., received a citation from Vice-Admiral James L. Kauffman, USN, Commandant of the Fourth Naval District, for services rendered to the United States Naval Reserve in 1947. Individual citations were also presented by Admiral Kauffman to Frank M. Folsom, executive vice-president in charge of the RCA Victor Division, and John K. West, director of public relations of the company.

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Changes Company Name

Al May has changed the name of his electrical business at 63 Water St, Aurora, Ill., from Al May Electric to Light House Electric Co.

NEW ELECTRICAL CONSTRUCTION

A weekly selection of U. S. electrical construction projects announced by private and government utility systems involving more than $70,000. Also listed are major industrial and construction jobs where electrical work is indicated or implied

UTILITIES

Proposed Construction

Arizona-Nevada—Bureau Reclamation, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Kingman (Louise), Ariz., main and station-service control equipment, load and frequency control equip., 460 volt station-service and unit power switchboards, battery chargers, 4,160 volt station-service unit substation and station-service and unit power transformers for installation in Davis Power Plant, Davis Dam Proj., Spec. 2010. W. R. Young, ch. engr.

Conn., Norwich—Atlantic Carton Co., N. Main and Second Sts., brick, steel factory addn. and power plant. **$3,000,000.**

Mich., Northville—A. N. Langius, dir. State Administrative Bd., Lansing, general construction, mechanical and electrical work for power plant, for Northville State Hospital. Approx. **$400,000.** Plans deposit $25. O'Dell Hewlett & Luckenbach, 2300 Dime Bank Bldg., Detroit, Zone 26, archts.

Minn., Minneapolis—Bd. Regents University of Minneapolis, Main Campus, R. S. Callaway, purch. agt., imprv. steam and power plants, installing boiler in main heating plant. **$300,000.** Helmick, Edeskuty & Lutz, 412 Essex Bldg., consult. engrs.

Neb., Hartington—Cedar Knox County Rural Public Power Dist., Hartington, 69-7-2 KV steel substation, equip. Henningson Eng. Co., 626 Standard Oil Co. Bldg., 15 St. and St. Marys Ave., Omaha, engr.

Okla., Schulter — Southwestern Power Admin., Dpt. Interior, 429 Kennedy Bldg., Tulsa, power transformers and oil circuit breakers for 66 k.v.a. outdoor switching station. **$160,000.** Plans deposit $15.

Pa., Phila.—Dpt. Property & Supplies, Harrisburg, renovating Bldgs. 8, 9, 10, 11 A and C, **$2,385,450;** relocation and increase capacity power and light substation **$159,023** both at Phila. (Byberry) State Hospital. A. F. Jones, c/o owner, ch. engr.

Washington—Bureau Reclamation, Dpt. Interior, Building 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Odair, one load-center-type unit substation, designation UZA for indoor operation for the service bldg., 230-kilovolt right switchyard, Grand Coulee Power Plant. Columbia Basin Proj., Spec. 2005.

Low Bidders & Contracts Awarded

California — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., three 231-kilovolt transmission lines, Shasta to Cottonwood, Gas Point Rd. and Keswick tap lines, Central Valley Project, Shasta Co., Spec. 1967, to Abbett Electric Co., 472 Tehama St., San Francisco. **$587,383.** Bids 10/24.

Illinois—Menard Electric Co-operative, Petersburg, 449 mi. rural distr. lines, Menard Co., to Continental Co., 245 Telford Ave., Dayton, O., labor **$195,728,** materials **$538,000,** total **$733,728.** Laramore & Douglas, 327 S. La Salle St., Chicago 3, Ill., engrs.

Mich., Lansing—City, condenser for Ottwa Street Power Plant, from C. H. Wheeler Mfg. Co., 19 and Lehigh Ave., Phila., Pa. **$120,910;** 275,000 lb. per hr. boiler, furnace, etc., from Babcock & Wilcox Co., 85 Liberty St., New York, N. Y. **$1,687,357.**

Minn., Willmar—City, E. H. Brogren, clk., municipal power plant piping, electric work and misc., to Commonwealth Electric Co., 417 Broadway, St. Paul. **$352,000.** Bids 10/6.

N. Y., Port Jefferson — Long Island Lighting Co., 250 Old Country Rd., Mineola, superstructure, generating station, to O'Driscoll Constr. Co., 347 Madison Ave., New York, Zone 17. Est. **$3,875,000,** incl. equip.

S. D., Winner—City, power and light plant and distr., to R. W. Hughes Co., Sunderland Bldg., Omaha, Neb. **$424,897.** Bids 9/29.

Tex., Dallas—Dallas Light & Power Co., Dallas Light & Power Co. Bldg., feeder lines, force account. **$110,200.**

INDUSTRIAL, COMMERCIAL & PUBLIC BUILDINGS

Proposed Construction

Calif., Los Angeles—Episcopal Diocese of Los Angeles, 621 S. Figueroa St., plans by Samuel E. Lunden, 400 Rowan Bldg., 458 S. Spring St., modernizing and rein.-con. addn. to Good Samaritan Hospital, 1212 Shallo St. **$2,000,000.**

O., Columbus—Ohio Health Dpt., Dr. J. D. Porterfield, dir., plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., tuberculosis hospital at Ohio State University. **$2,000,000.**

Tex., Beaumont—Beaumont Independent School Dist., Lee O. Smith, Bd. Educ. pres., voted bonds masonry type Main High School, **$580,000;** masonry school, W. 11 St. **$205,000;** masonry imprvs. and wing to Ogden School, **$310,000;** Carrol School imprvs. expansion **$686,000;** Averill, David Crockett, Dick Dowling, Fletcher, Vunken, Magnolia, Millard, Pennsylvania, Adams, Pipkin and Charlton-Pollar Schools. **$1,180,000.** W. B. Livesay, Beaumont, consult. archt.

Low Bidders & Contracts Awarded

Calif., Eureka—M. & M. Woodworking Co., 2301 N. Columbia Blvd., Portland, Ore., plywood factory known as Eureka Plywood Co., plant on 10 acre site. Owner builds. Est. **$1,000,000.**

Mo., Columbia—University of Missouri, c/o Curators, L. Cowan, vice-pres., Jesse Hall, Oct. 30, 4 story ground floor brick, limestone, Womens Dormitory A, from B. D. Simon Constr. Co., 802 Broadway, **$1,134,000;** 1 story, 134 x 193 ft., stone, brick, rein.-con. South Dormitory for Men and 3 story, ground floor, 39 x 75 ft., Defoe Hall addn. from MacDonald Constr. Co., 3827 W. Pine Blvd., St. Louis, Zone 8, **$3,021,276;** 3 story, ground floor, brick, limestone, rein.-con. U shaped West Dormitory for Men, from McCarthy Bros Constr. Co., 4903 Delmar Blvd., St. Louis, Zone 8, **$758,428.**

N. Y., Brooklyn—New York City Housing Auth., 122 E. 42 st., New York, Zone 17, Oct. 30, general contract Gowanus Houses Proj. (NYS-20), Wyckoff, Douglas, Bond and Hoyt Sts., from Willcox Constr. Corp., Inc., Maurice L. Bein, Inc., N. Fish Constr. Co., and James McHugh Sons, Inc., 25-20 41 Ave., Long Island City, **$6,457,000***heating and ventilating, from Heating Maintenance Corp. of New York, 220 E. 138 St., New York, Zone 51, **$751,750***electrical work, from Spitzer Electric Co., 420 Lexington Ave., New York, Zone 17, **$339,990***plumbing, from Lipsky & Rosenthal, Inc., Lexington Ave. and 115 St., New York, Zone 29, **$993,770.**

Pa., Pittsburgh—South Side Hospital S. 20 St., 9 story bsmnt., L shaped, brick, steel hospital addn., to Mellon Stuart Co., 210 E. Parkway. Est. **$1,350,000.** Press C. Dowler, Century Bldg., archt.

Wash., Longview—Pacific Paperboard Co., Longview, 100 x 400 ft. and 100 x 200 ft. steel, rein.-con. bldgs., with piling fdns. for newsprint mill, day labor. **$1,000,000.**

NEWS ABOUT PEOPLE

New Appointments Made in A-C Electrical Dept

Appointments to a newly created position of manager in charge of both sales and engineering have been made for all sections of the Allis-Chalmers electrical department. Among sections affected by the uniform organization plan is a newly formed electronics section and a substation section formerly called the mixed apparatus section.

Named manager of the motor and generator section is R. M. Casper, formerly engineer-in-charge of sales of the section. G. W. Clothier, who has been engineer-in-charge of transformer sales, has been appointed manager of the transformer section.

R. M. CASPER

G. W. CLOTHIER

H. A. Bartling, who has been assistant manager of the A-C industrial sales department, is now manager of the new electronics section, which incorporates sales and engineering functions of the former rectifier section and electronic sales and engineering groups which were previously part of the control section.

H. A. BARTLING

L. W. Long is now manager of the substation section, formerly known as the mixed apparatus section, which he had served as sales engineer-in-charge.

Mr Casper brings a variety of engineering experience to his new position. He was associated with Westinghouse Electric Corp from 1921 to 1924; Public Service Production Co (Public Service Corp of New Jersey system) from 1924-28; United Engineers & Constructors from 1928-30; Moloney Electric Co from 1930-33; Irving Trust Co, New York, from 1933-36. It was in 1936 that he became identified with Allis-Chalmers, serving first as sales representative in Detroit and since 1942 as sales engineer in charge of motor and generator sales.

Before joining A-C in 1936, Mr Clothier was an instructor at the University of Washington, his alma mater. For the past ten years he has been in the electrical department and was engineer-in-charge of transformer sales before his recent promotion.

Mr Bartling started with Allis-Chalmers in 1925 and five years later, after working on mine hoists, was transferred to the electrical department. Subsequently he served as a sales engineer for synchronous motors and assistant sales engineer in charge of the motor and generator sales. He became a part of the newly organized mixed apparatus section in 1941 and a year later was appointed assistant manager of the industrial sales department.

Following graduation from Penn State in 1923, Mr Long became identified with Bell Telephone in New York and was associated with the Pittsburgh Transformer Co when it was acquired by A-C in 1927. He served at the company's Pittsburgh Works until 1943, when he was named sales engineer-in-charge of mixed apparatus sales at the main works in West Allis.

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William C. Johnson Elected President of NEMA

William C. Johnson, executive vice-president in charge of the general machinery division of the Allis-Chalmers Manufacturing Co, Milwaukee, was elected president of the National Electrical Manufacturers Association at the annual meeting of the association held recently in Atlantic City.

W. C. JOHNSON

A native of Birmingham, Ala., Mr. Johnson joined A-C 23 years ago as a foundry helper. His executive career in the company embraces service in Atlanta, Chattanooga, and Knoxville in addition to Milwaukee.

Mr Johnson has served NEMA as a member of its board of governors and as a vice-president since 1944.

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▶ CHARLES H. SCHWANER has been named secretary-treasurer of the Tampa Electric Co, Tampa, Fla, to succeed

A. R. Hathaway, who was recently appointed treasurer of the Atlanta Gas Light Co. Mr Schwaner goes to Tampa from Savannah, Ga., where he was treasurer of the Savannah Electric & Power Co.

OBITUARY

Harry S. Black

Harry S. Black, senior vice-president and a member of the board of directors of the Ohio Brass Co, Mansfield, died suddenly at his home in that city on October 9 after a brief illness. Mr Black contributed considerably to the growth of the company during the past 50 years. A native of Mansfield, Mr Black joined the Ohio Brass Co in 1898, ten years after it was founded. In 1902 he was elected treasurer of the company and held this position until 1919, when he was elected vice-president. In 1928 Mr Black was named senior vice-president, the position he held at the time of his death.

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▶ SANDOR I. OESTERREICHER, an elecrtical engineer associated with the Metropolitan Device Corp, Brooklyn, N. Y., died on October 31 at his home in Brooklyn. He was born in Budapest, Hungary, 72 years ago. Mr Oesterreicher was educated at the Institute of Technology in Budapest and the Engineers Institute of the former Austro-Hungarian Navy, in which he served. He received the degree of mechanical engineer at the naval institute. Coming to this country in 1900, he started with the Sprague Electrical Co the following year. He was associated for nine years with the New York Edison Co before joining the Metropolitan Device Corp in 1914, advancing through the positions of assistant electrical engineer, electrical engineer and designing electrical engineer. He was particularly known for his design of electrical resistance welding machines and several types of current limiting reactors. Mr Oesterreicher wrote many papers for technological groups and scientific publications. He was a life member of AIEE.

▶ RALPH R. DAY, foreign project engineer for Sanderson & Porter, New York, died on November 1 at his home in Cornish, Me. Born in Cornish, he was graduated from the University of Maine in 1911. Mr Day was formerly with the J. G. White Engineering Corp in New York and had worked on projects in Haiti, Brazil, Canada, Central America and the Hawaiian Islands.

Preston S. Arkwright, Jr

Preston S. Arkwright, Jr, president of the Georgia Power Co since last February, died suddenly on November 6 in a hospital in Washington, D. C., after a blood clot had formed on his lungs. He was 44 years old. He had entered the hospital ten days before his death after suffering a rupture of the appendix.

Mr Arkwright's father was the guiding spirit in building up a coordinated utility system in Atlanta and for many years served as president of the Georgia

Power Co and its predecessor companies. At the time of his death late last year, he was chairman of the board.

Mr Arkwright, Jr, was a native of Atlanta and had been a member of the company's legal staff since 1926 when he was called to the presidency. He attended the Atlanta public schools and Emory University, from which he was graduated with the bachelor of philosophy degree in 1924 and a law degree in 1926. He was admitted to the bar and joined the law firm of Colquitt & Conyers in that year. The firm was later succeeded by Colquitt, Parker, Troutman and Arkwright, and in 1937 by MacDougald, Troutman and Arkwright. He had been a member of the board of directors of the Georgia Power Co since 1939.

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▶ ROY C. SLACK, who had been continuously associated with the American Gas & Electric Co System since first entering its employ in 1925, died suddenly in New York on October 10. Mr Slack began his career in the system with the Appalachian Electric Power Co in the Charleston general meter department. After occupying a number of responsible engineering positions with that company, he was transferred to Atlantic City, N. J., to assume the position of general meter superintendent of the Atlantic City Electric Co. While there he contributed greatly to the special work of standardizing the codes and practices governing electrical distribution systems, particularly those pertaining to the installation and inspection of customers' wiring, metering and equipment. In 1941 he became the manager of the Bridgeton division of that company. Early in 1944 Mr Slack was transferred to the New York office of American Gas & Electric Service Corp under Philip Sporn, vice-president and chief engineer. The following year he was appointed to the position of executive engineer. At the time of his death Mr Slack was budget engineer of the system.

▶ WILLIAM H. GALVANI, engineer and journalist, died at his home in Portland, Ore., on October 23 at the age of 84. Mr Galvani was born in Russia and coming to this country he went to Oregon in 1882. Educated as an engineer, he took many engineering assignments on Oregon railroads. In 1910 he went to work for the Pacific Power & Light Co, where he became engineer in charge of property, right-of-way and tax matters. He retired to his home at Seaside, Ore., in 1924. There he was elected mayor three times. Mr Galvani continued to maintain his offices in the Oregonian Building in Portland and his home on Broadway, across the way from the new Oregonian Building.

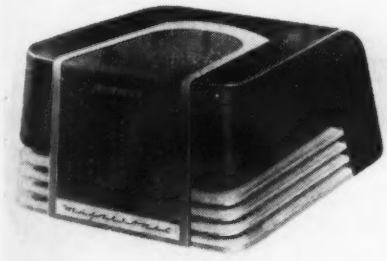
▶ LEWIS H. KNAPP, commercial manager of the Hartford (Conn.) Electric Light Co, died in Hartford on October 28. He was born in Bristol, Ind., and after being graduated from Purdue University in 1906, worked with General Electric at Schenectady. Mr Knapp joined the Hartford utility's power sales staff in 1927. Later he became sales manager. He was long active in the New England Power Engineers' Association.

▶ WALTER J. COFFING, superintendent of the Consumers Power Co plant in Kalamazoo, Mich., died suddenly on October 6. He was 44 years old. He was formerly assistant superintendent of the Garrett, Ind., municipal power plant.

▶ HOWARD H. BARROWS, formerly manager of General Electric's Oakland Lamp Works, Oakland, Calif., died October 12. Mr Barrows had been manager of the Lamp Works since 1915 until his retirement the first of this year. He was associated with the lamp manufacturing operations of the General Electric Co ever since his graduation in 1907 from the Case School of Applied Science.

NEW EQUIPMENT

Recorder, Reproducer



A RECENTLY DEVELOPED electronic instrument known as Magnesonic utilizes magnetic tape as a medium for recording and reproducing sound. The device is a product of Sound Recorder and Reproducer Corp, 5501 Wayne Ave, Philadelphia, Pa. Recordings can be made through a microphone, from a public address system or a radio.

Coated flat tape on reels has a speed of 7½ in. per sec and the recording and playback time is 30 min. Rewind time is 2 min and by speed adjustment the tape can be moved forward at any point desired. By automatic erasure ability, the tape can be re-used many times if permanent recordings are not desired.

Amplifier audio-frequency response is stated to range from 30 to 20,000 cycles flat to plus or minus 3 db, uncompensated. Power output is 8 kw. The chassis with six tubes and the P. M. loudspeaker are housed in a black ebony-finished wooden cabinet.

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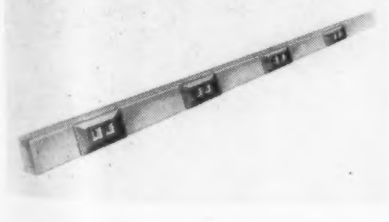
Prewired Raceway

READY-TO-INSTALL prewired Plugmold in 3-ft and 6-ft lengths, with outlets wired in position on either 6-in. or 18-in. centers, is made available by Wiremold Co, Hartford, Conn. Depth is $\frac{9}{16}$ in. and width is $1\frac{3}{8}$ in.

Convenience outlets may be added or relocated and fittings in the No. 1900 Plugmold line are usable with it. Each length is furnished with a connector block at one end and a blank fitting on the other end, and wired for connection to the adjoining section. In addition each length is furnished with a cover coupling and sufficient No. 6, 1½-in., flat-head wood screws to complete the installation.



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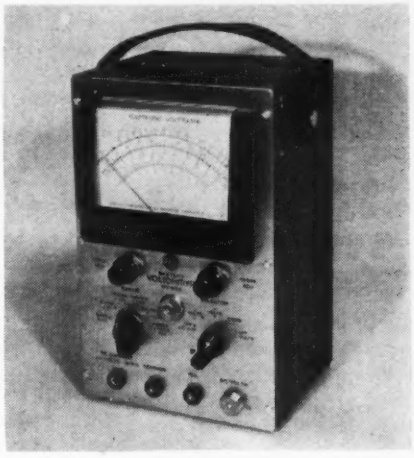
Electronic Voltmeter

A SELF-CONTAINED vacuum-tube voltmeter, known as a Battery VoltOhmyst, Type WV 65-A, operates independent of external power and was developed by RCA Victor of Camden, N. J. The meter can be used for servicing electronic and radio equipment in industrial installations, in rural areas and in automobiles.



Used with the RCA crystal probe, the meter can be employed for measurements up to 100 megacycles. The neon lamp on front of panel flashes to indicate when the instrument is in operation. Including batteries, the portable unit weighs 9 lb. It measures 9½ in. high, 6¼ in. wide and 5½ in. deep.

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Kitchen Luminaire

BY COMBINING the use of a 32-watt Circline fluorescent bulb and a 100-watt filament bulb, shielded by a white ceramic-glass bowl, the new Circle-Plus kitchen has been developed by Mitchell Manufacturing Co, 2525 Clybourn Ave, Chicago 14, Ill. When energized, the incandescent bulb provides instant lighting and the fluorescent goes on a few minutes later.

The unit uses the latest ballast, starter and clear-plastic holders for the Circline bulb, and may be used only on 110-125-v, 60-cycle circuits. It is 10⅞ in. in diameter, 7¾ in. high over-all, and has a metal flange finished in white baked enamel.

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Rotary Drill

PULVERIZING ACTION is provided in a rotary drill recently announced by Concrete Termite Sales Co, 2301 Main St, Santa Monica, Calif. An electric drill unit is used for the driving source.

Drills are available in $\frac{1}{16}$-in. sizes from ½ to 1½-in. diameters. Straight and clean holes are said to be drilled in concrete, marble, tile and other masonry-like material. Users report 3 in. of concrete can be drilled in less than 50 sec. using a ½-in. Concrete Termite drill.

ELECTRICAL BUSINESS OUTLOOK

INDUSTRIAL POWER LOADS have moved steadily higher over the past several months. Most industries —that suffered a dip in output at midyear have now realized a substantial recovery.

Nowhere in the immediate outlook are there signs that production will turn lower this year. This is far and away the most significant element in the year-end power situation. It means that utilities have had to adjust their sights higher by another notch.

Here is the way industrial output has recovered. Over-all, the Federal Reserve index of production has climbed from 178 in July to about 186 in October. Post-war peak in March was 190. Industrial groups of chief interest to utilities have shifted as follows: (for all indexes 1935-39 = 100).

	March	July	Sept.
Iron, Steel and Products	196	181	194
Machinery	281	268	274
Non-ferrous metals	196	179	171
Autos and Transport Equipment	237	217	223
Stone, clay, glass	218	196	198
Textiles and products	122	107	116
Rubber products	239	209	212
Manufactured Foods	157	154	157
Chemical products	252	250	251
Petroleum and Coal Products	186	184	200

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MACHINERY PRODUCTION needs to be watched closely. Many firms are now fixing their capital budgets for 1948. How these add up has an important bearing on the over-all business outlook for next year.

For some equipment fields, of course, 1948 is no longer much of a question-mark. Electrical apparatus is one. Others are coal, petroleum, rail textile and farm equipment. Output is not expected to drop in these. It will move higher if steel is available.

The Marshall program will bring a flood of new orders to most of these industries. The only exceptions in the above list are electrical apparatus and textile equipment. Western Europe plans to meet these needs from its own production.

Machine-tool producers are another group who look for a better year in 1948. Current estimates place the possible advance as high as a fourth.

With all these equipment lines doing as well or better in 1948, machinery production as a whole can't take a severe drop. This suggests that power sales are likely to hold up very well through much of 1948 at the least.

UNEMPLOYMENT in October was 1.7 million, lowest since the war. This is a rock-bottom figure for peace time. It serves as another reminder of the tremendous pace at which the economy is running.

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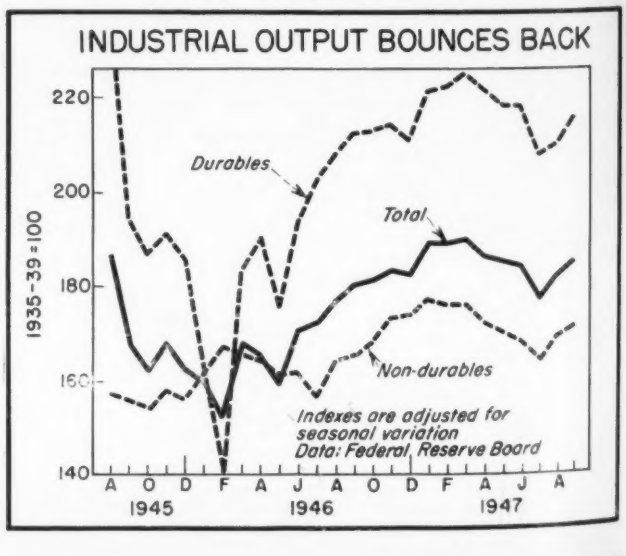
PRICES NOW REST on a new plateau. The over-all average at wholesale has remained substantially unchanged for a month—but at 7 percent above midyear.

The movement since midyear has been general. Farm and fuel prices have risen more than others. But no broad group has escaped without change. Even the average of electricity prices has gone up slightly because of higher fuel costs.

Big objective now is to hold the current level. This can be done. However, it requires two things: 1) a good break on next year's farm crops; and 2) restraint in labor's third round wage demands.

So far the cost of living has advanced only 4 percent since spring. It may move up a bit more in the winter—but not greatly. Much will depend on food prices. These, in turn, hang on supplies.

A wage advance equal to the rise in living costs might not affect prices greatly. Anything greater, however, would probably require many producers to mark up price tags once again.

This conclusion is supported by a survey of labor productivity conducted by *Factory Management and Maintenance*. They report that 92 percent of the companies covered expect some further gain in productivity next year. But the anticipated advance averages only 7 percent.

Estimates of electrical manufacturers varied widely. Large companies look for a smaller gain than small companies. However, in few instances would the increase in productivity, if finally realized, match a hike in wages similar to this year.